REMARKS

Claims 1-24 are pending. Claims 1-24 are rejected.

DOUBLE PATENTING

Claims 1-4, 6-9, 11-14, 16-19, and 21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9, 13-21, and 25 of copending Application No. 12/034,918 in view of Giorgini et al (USP No. 7,138,437—already made of record).

Since there are no allowed claims as yet, and claims 1-4, 6-9, 11-14, 16-19, and 21 have been provisionally rejected, applicants will defer filing a response to this nonstatutory obviousness-type double patenting rejection at this time.

Claim Rejections – 35 USC § 103

Claims 1-24 are rejected under 35 USC 103(a) as being unpatentable over US Pat. No. 7,138,437 to Giorgini et al. ("Giorgini") in view of US Pat. No. 4,295,259 to Rhodes et al. ("Rhodes") as evidenced by US Pat No. 5,173,222 to Young et al. ("Young").

Applicants have amended claims 1-24 to use the transitional phrase "consisting essentially of" with respect to describe the compounds which are employed to form the poly(urethane-urea) material. Additional materials such as, diluents, fillers, combatilizers, thixotropes, pigments, and anti-settling agents can be added to the polymeric material but are not employed in forming the poly(urethane-urea) material.

Applicants traverse the above rejection Giorgini, Rhodes and Young are not applicable to claims 1-24 for the reasons set forth below.

Giorgini does not teach a method for repairing structural members by using a poly(urethane-urea) material which can be contoured and restored in the manner described in amended claims 1, 11 and 21. The subject claims are directed to the restoration of a damaged rail seat. The damaged rail seat is located on the upper surface of a concrete rail tie.

This is a totally different environment than Giorgini which describes to a spike hole or defect in a wooden rail tie which does not teach, suggest or require contouring of a polymeric material and restoring of the contoured polymeric material. The reason for this is that Giorgini does not relate to a rail seat located on the upper surface of a rail tie. More specifically, in subject claims a polymeric material comprising a poly (urethane-urea) material is applied to the damaged rail seat located on the upper surface of the concrete rail tie. The poly (urethane-urea) material being formed employs compounds consisting essentially of (a) at least one polyol compound, (b) at least one amine compound, and (c) an isocyanate compound. Applicant's material is not a polyurethane composition as is the material of Giorgini. Giorgini describes its polyurethane as a foamable polyurethane composition (see col.2, line 37). Applicant's claimed poly (urethane-urea) material is not foamable. Polyurethanes, and particularly foamable polyurethanes, cannot be contoured and employed to restore damaged rail seats on concrete rail ties to the original dimensions of an undamaged rail seat in the manner claimed herein. They are not able to be sag resistant and maintain their shape without substantial runoff from the concrete rail tie during said contouring of the polymeric material. Therefore, polyurethanes, and particularly foamable polyurethanes, cannot be employed to restore a damaged rail seat since they are not sag resistant and able to maintain their shape without substantial runoff from the concrete rail tie during the restoring of the damaged rail seat. It is quite evident that contouring and restoring as described above are separate steps both of which are not equivalent to curing according to the teachings of Giorgini.

As stated in claims 1, 11 and 21, the polymeric material applied to the damaged rail seat on the upper surface of the concrete rail tie forms a contoured damaged rail seat having substantially the original dimensions of an undamaged rail seat. Thus, the contoured damaged rail seat is substantially sag resistant and maintaining its shape without substantial runoff from the concrete rail tie during said contouring of the polymeric material. Then, the contoured damaged rail seat on said concrete rail tie can be restored by curing the polymeric material under ambient temperature and pressure conditions to form a restored rail seat. The restored rail seat is substantially sag resistant and maintains its shape without substantial runoff from the concrete rail tie during the restoring of the damaged rail seat.

When the rail ties are restored according the method herein, the rail seat maintains the gauge of a rail assembly under dynamic operating conditions. Furthermore, the restored rail seat can have a modulus which is increased to a level which will resist compressive loading and maintain the rail gauge of the rail assembly. Giorgini does not teach or suggest how to restore a "damaged rail seat" so that it can either maintains the gauge of a rail assembly under dynamic operating conditions or can have a modulus which is increased to a level which will resist compressive loading and maintain the rail gauge of the rail assembly.

The Examiner has stated that the final product of Giorgini will have urea linkages in a polyurethane foam composition. This is because Giorgini adds a polyamine as a "gelling agent" to the polyurethane foam to form these urea linkages. Just because a polyurethane, and particularly a foam polyurethane, has urea linkages does not make it a poly (urethane-urea) material which can restore a rail seat on a concrete rail tie in the manner described in applicants' claims.

The gelling agent's function in Giorgini is not to form the claimed poly (urethane-urea) material. Instead, its purpose is to prevent environmental water at the substrate/material interface from reacting with the isocyanate component. In formulating terms, this is described as a surface-acting agent to provide a particular property or a desired surface effect. In other words, at the surface/material interface the polyamine reacts quickly to form a 'skin' or cured surface and prevents further isocyanate-water interaction by decreasing the diffusion rate of water by increasing the surface density of the material. This surface-acting effect is very common in foam formulations and in particular at the atmospheric/material surface where amines, both polyamine and amine catalysts, form skins or very dense surfaces over a foam. So, the mere use of polyamines to thicken the material surface and prevent the isocyanate component from further reacting with environmental moisture does not change materially change the composition of the polyurethane foam composition of Giorgini. Having "urea linkages" in a polyurethane composition does not mean that Giorgini has form a poly (urea-urethane) material, much less a poly (urea-urethane) material as described in claims 1, 11 and 21.

Applicants have incorporated polyamines in their formulation to actually create a polyurea network throughout the material. This in fact facilitates the formation of a poly (urethane-urea) material. This poly (urethane-urea) network prevents the material from sagging and flowing during contouring due to the presence of its three dimensional network structure. The consequence is that the claimed method is not directed to just a surface reaction as in Giorgini. Applicants' restoration enhances the formation of a contoured damaged rail seat which has substantially the original dimension of an undamaged rail seat. In this way, the subject polyurethane-urea material can be dispensed on a surface without running off. Contrarily, the Giorgini material is not sag resistant, will not maintain its shape, but instead will simply roll off the surface while forming a surface skin as described above due to the presence of environmental water. Giorgini can only function within a confined space in which it can form a fully cured polyurethane rail hole plug even though it does not have sufficient structural integrity as a stand-alone entity during the curing process. It also requires the use of strengthening agents to enhance its physical properties to level required for rail tie plugging purposes.

The Examiner states that Giorgini teaches that a polyurethane mixture is applied to the rail tie void (defect), and that the polyurethane material is cured to repair the rail tie. The claimed method relates to the application of a poly (urethane-urea) material, not a foam polyurethane material, to a damaged rail seat located on the concrete rail tie, not to a rail tie void or defect. Curing a foam polyurethane in a rail tie void in a wooden rail tie is totally different than curing a contoured damaged rail seat on said concrete rail tie. As previously stated, a concrete rail tie does not have a rail tie spike hole as do wooden ties. Wooden rail tie holes and concrete defects are clearly not a damaged rail seat located on the concrete rail tie.

In Giorgini, the foam polyurethane material is not sag resistant because it doesn't have to be sag resistant. Instead, the spike hole or defects described in Giorgini act a mold during the formation of the foam polyurethane. Strengthening agents are added so that the final cured product has sufficient strength. _Giorgini is not self-supporting and the polyurethane foam is not capable of being contoured to form a contoured damaged rail seat having substantially the original dimensions of an undamaged rail seat because it is not sag resistant.

Even though rail seats can be made of polyurethane, it would not have been obvious to apply the teachings of Giorgini to include the repair of the rail seat portion of the rail tie assembly as claimed by applicants. The claimed restoration of rail seats is not conducted using a self-sagging polyurethane foam as described in Giorgini. Therefore, it would not have been obvious for one having the ordinary skill in the art apply Giorgini's process to rail seats.

Rail ties themselves are typically wood, not concrete. Concrete rail ties do not have spike holes located therewithin. Small defects in these concrete rail ties, which form a mold for self-sagging foam polyurethanes, are said to be repaired using the process of Giorgini but they are not required to maintain the gauge of a rail assembly under dynamic operating conditions, properly bond to an abrasion plate, and have a modulus which is increased to a level which will resist compressive loading and maintain the rail gauge of a rail assembly. Since there are no spike holes in concrete rail ties, there are not spike holes to repair. Even though foam polyurethane is added to repair defects in Giorgini, this self-sagging foam polyurethane material is unable to fix other polymeric rail tie components such as a rail seats for the reasons set forth above.

The claimed polymeric material is substantially sag resistant and maintaining its shape without substantial runoff from the concrete rail tie during said restoring of the damaged rail seat, and prior to fully curing of the poly(urethane-urea). This overcomes the above problems which exist when damaged rail seats on concrete rail ties are restored. This problem does not occur when a polymeric material is plugged into a wooden rail tie void prior to reintroducing a rail spike into the cured polymeric plug. The spike hole confines the polyurethane material during the curing process so that sag and runoff do not occur in repairing spike holes in wooden rail ties. Poly(urethane-urea) which applicants have determined maintains its shape without substantial runoff from the concrete rail tie during restoration of the damaged rail seat is not needed in repairing spike holes in wooden rail ties. Therefore, it is not necessary for the spike hole plug material to have sag resistance and prevent runoff during curing. A thin coating on a concrete rail seat is much more difficult to cure at low temperature due to

substantial heat absorption by the concrete mass. Heat absorption is not as critical in a spike hole on a wooden tie because the polymer is applied as a larger mass (not a coating), which generates heat through an exothermic reaction, and more heat is retained due to the insulating properties of the wooden tie.

With respect to claim 1, the Examiner admits that Giorgini does not expressly teach restoring the damaged rail seat by curing the polymeric material under ambient temperature and pressure conditions. Rhodes teaches a method of repairing spike holes in a wooden railway tie which is totally different than amended claim 1. Rhodes adds its polyurethane foam to a spike hole in a wooden rail tie which acts as a mold for the formation of the cured polymeric material. The repaired articles formed from the processes disclosed in Giorgini and Rhodes do not have the claimed sag resistance nor the ability to maintain its shape without substantial run-off. Again, the formation of a cured foam polyurethane in a spike hole or defect is not the claimed method of forming a rail seat on a concrete which includes the step of forming a contoured damaged rail tie and a restored rail seat which are both sag resistant without substantial runoff during both the contouring and restoring steps.

Rhodes does not teach restoring rail seats on concrete ties, but as in Giorgini, describes a method of filling spike holes in wooden railway ties. Filling spike holes in wooden rail ties is substantially different from restoring rail seats on concrete rail ties for all the reasons set forth above. Rhodes teaches a method of plugging a spike hole in a wooden railroad tie by adding a polyurethane foam which is totally different than applying poly(urethane-urea) to an abraded rail seat to form a contoured damage rail seat for the reasons set forth above. Rhodes does not have the required sag resistance and runoff resistance during application and prior to full cure of the polymer as described above. Giorgini and Rhodes are analogous art to each other because they are from the same field of endeavor, namely plugging spike holes in wooden rail ties with polyurethane materials. However, Giorgini and Rhodes are not analogous art with respect to the subject claims which relate to restoring rail seats on concrete railroad ties with a poly(urethane-urea) material. The two cannot be considered analogous because they are different

technologies, different materials of construction, behave differently, have different problems to overcome, etc.

Rhodes employs polyurethane foam compositions. As previously stated, the polymeric material claimed in the above-described patent application is a solid (non-foam), high-density, poly(urethane-urea) material. Conventionally, rail seats in concrete rail ties are not made of foam polyurethane. The use of a foam material would be totally unacceptable and unsuitable for the repair of rail seats on concrete ties. A polyurethane foam will undergo deformation and fatigue due to pressure and temperature. Polyurethane foams can be used in confined areas such as spike holes, but they are not employed in unsupported and non-confined areas such as on an abraded rail seat. As previously explained in the prior filed Amendment, there is also instability caused to polyurethane foams by environmental moisture.

Furthermore, the polyurethane material described by Giorgini (and Rhodes and Young) is only sag resistant after (not during) the curing stage. Since the claimed poly(urethane-urea) has sag resistant and runoff prevention properties when it is initially dispensed, the need for applying plates, clamps and other containment equipment to enclose and confine the repair material during curing is alleviated. Thus, a fully restored rail seat article is produced by the claimed method without requiring auxiliary containment equipment which would be needed if an epoxy or polyurethane material are employed.

With respect to claims 1, 11, and 25, the Examiner admits that the combination of Giorgini and Rhodes do not expressly teach wherein the polyurethane material is to be used to cure defects in rail seats. Applicants employ a poly (urethane-urea) material which is clearly not taught by the prior art cited. The subject process, a stated above, forms a free-standing contoured damaged rail seat and a free-standing restore rail seat without the use of auxiliary support or the use of confining void tie holes or defects to facilitate the curing process. The Examiner has cited Young stating that it provides motivation that one having the ordinary skill in the art would look to repair defects in a rail tie and rail seat with an epoxy. As previously stated, the state of the art for rail seat repair by others than the assignee of the above-

reference application, such as Young, involve the use of epoxy materials which cure fairly slowly. Young describes problems in repairing abraded ties quickly enough to limit hold up to freight traffic to an acceptable time, and in restoring badly abraded rail seats to their original dimensions. Young also states (column 1, line 63) that "if freight trains are run even slowly over the freshly repaired rail seats, if the epoxy is still in a plastic state, it will be pumped out thus up setting the true level of the rail seat...".

Young's solution to the above problem requires using equipment such as clamps for confining the epoxy material, and applying heat and pressure to the confined epoxy material. However, the claimed method employs a poly(urethane-urea) material which does not require confining equipment, nor does it need to employ heat or pressure. Even when epoxy is applied in a relatively thin layer, the cure time can take 12 to 36 hours at typical ambient temperatures. This is completely unacceptable from a train operator's point of view. If the trains are running even slowly over the freshly repaired rail seats, and if the epoxy is still in a plastic state, it will run-off. This will disrupt the true level of the rail seat, causing cavities to form in the rail seat material. This also results in improper bonding to the abrasion plate. All of these factors will lead to subsequent failure of the rail seat.

Young is able to speed up the repair process by confining the epoxy material using confinement equipment, and then having to apply heat and pressure (all of which are cumbersome and difficult to handle). Our claims define technology which is a substantial improvement over Young for the following reasons: 1) there is no confinement equipment which is required; 2) there is no pressure which is required; 3) there is no heat which is required; and 4) the claimed poly(urethane-urea) material meets the requirements which are not met by epoxy materials such as durability, strength, adhesion, gel time, compressive loading, elongation, speed, ease of application, etc.

The Examiner admits, regarding claim 11, that Giorgini does not teach wherein the curing of the polymeric material can be at an ambient temperature as low as 45 F. The Examiner states that Rhodes teaches polyurethane foam materials are curable at an outdoor

ambient temperature and pressure. Again, Rhodes is dealing with a polyurethane foam used in spike holes for the repair of wooden railroad ties. Our claims are directed toward concrete railroad ties which are substantially different from wooden railroad ties. Filling a spike hole in a confined area is totally different from unconfined and unsupported contouring of a poly (urethane-urea) material applied to a damaged rail seat on a concrete rail seat. Maintaining sag resistant and the shape of the foam polyurethane material without substantial runoff at an ambient temperature as low as 45 F cannot be accomplished using the polyurethane foam of Rhodes.

Regarding claims 1, 11 and 21, Giorgini does not teach wherein the composition used to repair the rail tie relates to a poly (urethane-urea) material consisting essentially of (a) at least one polyol compound, (b) at least one amine compound, and (c) an isocyanate compound. These are the main components and thus Giorgini does not read on the claim limitation a poly (urethane-urea) material consisting essentially of reactants (a), (b) and (c).

The Examiner admits that, regarding claim 1, Giorgini does not teach wherein the curing is done without the use of non-ambient heat and pressure. Again, the Examiner states that Rhodes teaches polyurethane foam materials are curable at an outdoor ambient temperature and pressure. As stated above, Rhodes is dealing with a polyurethane foam used in spike holes for the repair of wooden railroad ties. Our claims are directed toward concrete railroad ties which are substantially different from wooden railroad ties. Filling a spike hole in a confined area is totally different from unconfined and unsupported contouring of a poly (urethane-urea) material applied to a damaged rail seat on a concrete rail seat. Maintaining sag resistant and the shape of the foam polyurethane material without substantial runoff at an ambient temperature and pressure cannot be accomplished using the polyurethane foam of Rhodes. The claimed method and Rhodes are totally different and cannot be compared.

Regarding claims 2-3 and 12-13, the Examiner admits that Giorgini does not teach: (1) wherein the damage rail seat is restored without requiring the use of non-ambient heat and (2)

wherein the damage rail seat is restored without requiring the use of non-ambient pressure. The Examiner states that Rhodes teaches wherein the polyurethane is curable at an outdoor ambient temperature and pressure. Rhodes does not teach the claims 2-3 and 12-13 for the reasons set forth above with respect to Rhodes regarding claims 1 and 11. Maintaining sag resistant and the shape of the foam polyurethane material without substantial runoff without the use of ambient temperature and pressure cannot be accomplished using the polyurethane foam of Rhodes. The claimed method and Rhodes are totally different and cannot be compared.

Regarding claims 4-5 and 14-15, for the reasons set forth above, Giorgini does not teach wherein a poly (urethane-urea) material which has a gel time that can be less than 5 seconds, or less than 1 second, and which is used in the contouring and restoration of a damaged rail seat. Maintaining sag resistant and the shape of the foam polyurethane material without substantial runoff at the gel times set forth above cannot be accomplished using the polyurethane foam of Rhodes. The claimed method and Rhodes are totally different and cannot be compared.

Regarding claims 6 and 16, Giorgini does not teach wherein the Set Time of the polymeric material is sufficient for contouring the restored rail seat in situ without requiring the use of non-ambient heat. Maintaining sag resistant and the shape of the foam polyurethane material without substantial runoff at a set times set forth above which is sufficient for contouring the polymeric material cannot be accomplished using the polyurethane foam of Rhodes. The fact that someone understands that conducting rail repairs in a manner that minimizes the need for addition machinery or laborers doesn't means that can actually provide a method which accomplishes this result. The claimed method and Rhodes are totally different and cannot be compared.

The Examiner admits that regarding claims 7-10 and 17-20, the combination of Giorgini and Rhodes do not expressly teach: (1) wherein the rail ties having the restored rail seat maintains the gauge of a rail assembly under dynamic operating conditions; (2) wherein the modulus of the restored rail seat is increased to a level which will resist compressive loading and maintain the rail gauge of the rail assembly; (3) wherein the Elongation of the restored rail

seat is at least about 10%; and (4) wherein the Shore D (24 hour) Hardness of the restored rail seat is at least about 65. The Examiner states that Rhodes teaches that polyurethane would lead to a rail assembly system that does not deform or fatigue due to temperature or pressure changes. Again, as described above, Rhodes specifically deals with polyurethane foam used in a confined spike hole which is not a suitable material for the repair of rail seats on concrete ties. A polyurethane foam will clearly undergo substantial deformation and fatigue due to pressure and temperature when in an unsupported and unconfined environment. The use of strength enhancers, hydrophobic enhancers, and impact absorption enhancers, as described in Rhodes, will not overcome the fact that foam polyurethanes in an unsupported and unconfined environment will undergo substantial deformation and fatigue. Rhodes does not teach the claims 7-10 and 17-20 for the reasons set forth above. The claimed method and Rhodes are totally different and cannot be compared.

Maintaining sag resistant and the shape of the foam polyurethane material without substantial runoff at a set times set forth above which is sufficient for contouring the polymeric material cannot be accomplished using the polyurethane foam of Rhodes. One of ordinary skill in the art would not have obviously recognized that the claimed properties of the restored rail seat would have naturally flowed from the claimed process and the claimed materials used in the claimed process…because they don't. Giorgini in view of Rhodes does not provide the same process and the same materials as the claimed invention for the numerous reasons set forth above. One of ordinary skill in the art would obviously recognize, since all things are not equal (process and materials), that the process of Giorgini and Rhodes would not produce a restore rail seat having the claimed properties.

Regarding claims 22-24, Giorgini teaches wherein the polyurethane consists of at least one polyol compound and an isocyanate. However, claims 22-24 to a poly(urethane-urea) material, as described in detail above. This poly(urethane-urea) material consists essentially of (a) a hydroxyl capped polyol and/or a hydroxyl chain extender, (b) an amine capped polyether and/or an amine chain extender, and (c) an isocyanate compound. The polyurethane materials of Giorgini, Young and/or Rhodes do not consist essentially of (a) a hydroxyl capped polyol

and/or a hydroxyl chain extender, (b) an amine capped polyether and/or an amine chain extender, and (c) an isocyanate compound. Therefore, new claims 22-24 patentably distinguish over Giorgini, Young and/or Rhodes.

Regarding the rejections described above, if a proposal for modifying the prior art in an effort to attain the claimed invention causes the art to become inoperable or destroys its intended function, then the requisite motivation to make the modification would not have existed. *See In re Fritch*, 972 F.2d at 1265 n.12 ("A proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purpose."). Therefore, the rejection of claims 1-24 is clearly erroneous for the reasons set forth above.

Regarding the rejections described above, "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 353 F.2d 238, 241 (CCPA 1965); see also Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 448-49 (Fed. Cir. 1986). Therefore, claims 1-24 are allowable.

For the foregoing reasons, reconsideration and allowance of claims 1-24 of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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